

REMARKS

In the Office Action, made final, the Examiner rejected all claims 4-10 and 12-17 under 35 U.S.C. 103 for being obvious. Claims 5 and 12 are cancelled. Claims 4, 6-10, and 13-17 remain in the application.

The rejection for obviousness was based on Matsumoto in combination with Rutten. Both disclose ways of making contact to a substrate in the context of SOI. Rutten's purpose is to provide for ESD protection in a SOI substrate and discloses a substrate contact in this context. Both teach forming a well in the substrate and a heavily doped region in the well for forming the contact at the overlying via. That a heavily doped region is beneficial in forming such a contact is well known. Rutten teaches forming a well in the substrate, apparently before any other layer on the substrate is formed, even before the insulating layer and the active layer that make it into a SOI substrate. This is implied by the sequence of the description at column 6, lines 6-34 and the figures. In any event, Rutten discloses that the well and the heavily doped contact region are formed before any opening in the active region is formed. The implants to form the well and doped region do not pass through an opening in the active layer, which is layer 4 in Rutten.

Similarly for Matsumoto, the well in the substrate is formed by an implant that passes through the active layer. This is shown in FIG. 1B and 1C in which layer 3 is the active layer. The well 5 is formed directly under layer 3. There is arguably an opening in layer 3 caused by the formation of layer 4 in place of portions of layer 3 that the implant passes through. But there is no teaching of a mask over this active layer 3 that blocks the implant. There is a photoresist mask but there is no teaching or suggestion that it is over any portion of the active layer. Further, this implant is taught as being a well implant. Well implants are known to be lightly doped, which is less doping than for via contacts. Matsumoto then uses a subsequent implant to form the heavily doped region that is used for the via contact. This implant to form the heavily doped region is performed coincident with the source/drain implant that uses a gate as a self-aligning mask. Thus, the heavily doped region is not formed until after the gate is formed.

The independent claims have been amended to clarify the distinctions from these two references. Claim 4, for example, has been amended to include the requirement of:

providing a semiconductor stack including an active layer formed on a first insulator layer and a masking layer over the active layer, wherein the first insulator layer

is formed on the semiconductor substrate and wherein the active layer and the masking layer are patterned to have an opening;

This claim 4 further requires that "the masking layer operates as a mask to the implanting." Neither of these two references separately or together, teach or suggest this combination of a mask over the active layer that acts as a mask to the implant and the mask having an opening through which the implant passes. Further, claim 4 now requires that this implant result in a heavily doped region. Wells are not considered heavily doped regions so the wells of Matsumoto and Rutten do not meet this requirement. This is particularly relevant to Matsumoto because the timing of the well formation is significantly different than that for the heavily doped contact region.

Independent claims 10 and 17 now have similar requirements. Claim 10 for example now requires that the doped region be heavily doped and of such a doping level to be sufficient for forming a contact and that the doped region be formed before forming the gate and after forming the semiconductor stack that includes the active layer. Claim 17 also has a similar requirement for the doped region being heavily doped sufficient for forming a contact and also that the implant that forms the doped region be performed prior to forming an insulating layer through which the contact via passes and that the implant pass through an opening in the active layer. Thus, it is clear that the claims as clarified distinguish from Matsumoto and Rutten both individually and in combination.

Claim 5 was cancelled because it lacked antecedent basis which arose when claim 4 was first amended and claim 3 cancelled. Claim 12 has been similarly cancelled in light of this and other amendments to claim 10.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless Applicant has argued herein that such amendment was made to distinguish over a particular reference or combination of references.

Applicant believes the application is in condition for allowance which action is respectfully solicited. Please contact the below-signed if there are any issues regarding this communication or otherwise concerning the current application.

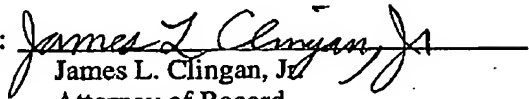
Respectfully submitted,

SEND CORRESPONDENCE TO:

Motorola, Inc.
Law Department

Customer Number: 23125

By:


James L. Clingan, Jr.

Attorney of Record

Reg. No.: 30,163

Telephone: (512) 996-6839

Fax No.: (512) 996-6854

Email: Jim.Clingan@Motorola.com